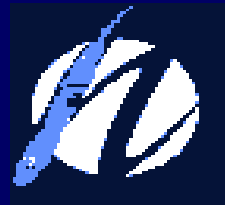


Transportation and Health
Public Transportation Conference
August 24, 2005

Juliet VanEenwyk, PhD
State Epidemiologist for Non-Infectious Conditions



Washington State
Department of Health

....always working for a safer
and healthier Washington

Gaining prominence.....



SPRING 2003
Volume 2 Issue 1

Land Use and Public Health

By Robert Glandon, PhD,
County (MI) Health Depart

The student population... years. Many students... neighborhoods and pe... pin. Recently a private comp... north side of the city, just over... apartments. Yet the main con... inadequate: there were no lak... means. A car struck two coe... killed and the other was sever... Across town, a large apart... The road did not have sidewa... struck and killed the mother... near the complex. In yet another situation, a... sidewalk to the area. A car... the side of the road. Are these chance accidents... our communities? And if the... public health address the issa...

Smart Growth: Protecting Community Environmental Quality

By Geoffrey Anderson, Director, Development, Community, and Environment Division, U.S. Environmental Protection Agency

During the past decade, smart growth has emerged as a powerful strategy for building community, catalyzing economic development, and protecting the environment. Evidence of this trend is everywhere. Of the 100 bold initiatives related to state and local conservation considered by voters in 2002, 141 were approved. Newly elected governors in Massachusetts, Pennsylvania, and Michigan appear poised to make smart growth a high priority. The New England News, an industry publication that tracks new projects, reported that smart growth communities and projects were built in record numbers, continuing a five-year upward trend. Cities across Wisconsin, communities in Ohio, and the City of Chicago are re-examining and

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Spring 2003
Transportation:
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To Do With It?



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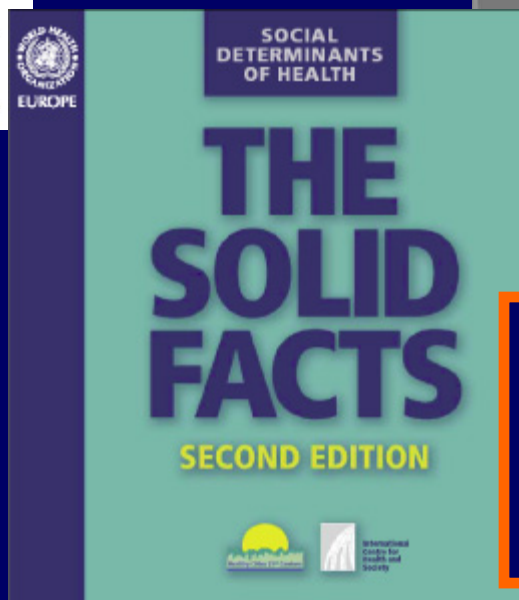
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Public
Health



World Health
Organization, 2003
Chapter 10
Transportation



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Transportation and Health: Which way to go?



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Transportation and Health: Which way to go?



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Sound Walls Along Highways

- California Leads Nation: 112 miles in LA alone
- \$300/linear foot
- \$1,250,000/mile



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http://www.dot.ca.gov/dist07/aboutdist7/facts/fs_scans/fs_fsw.shtml

Crashes

Obesity

Air pollution

Social determi-
nants of health

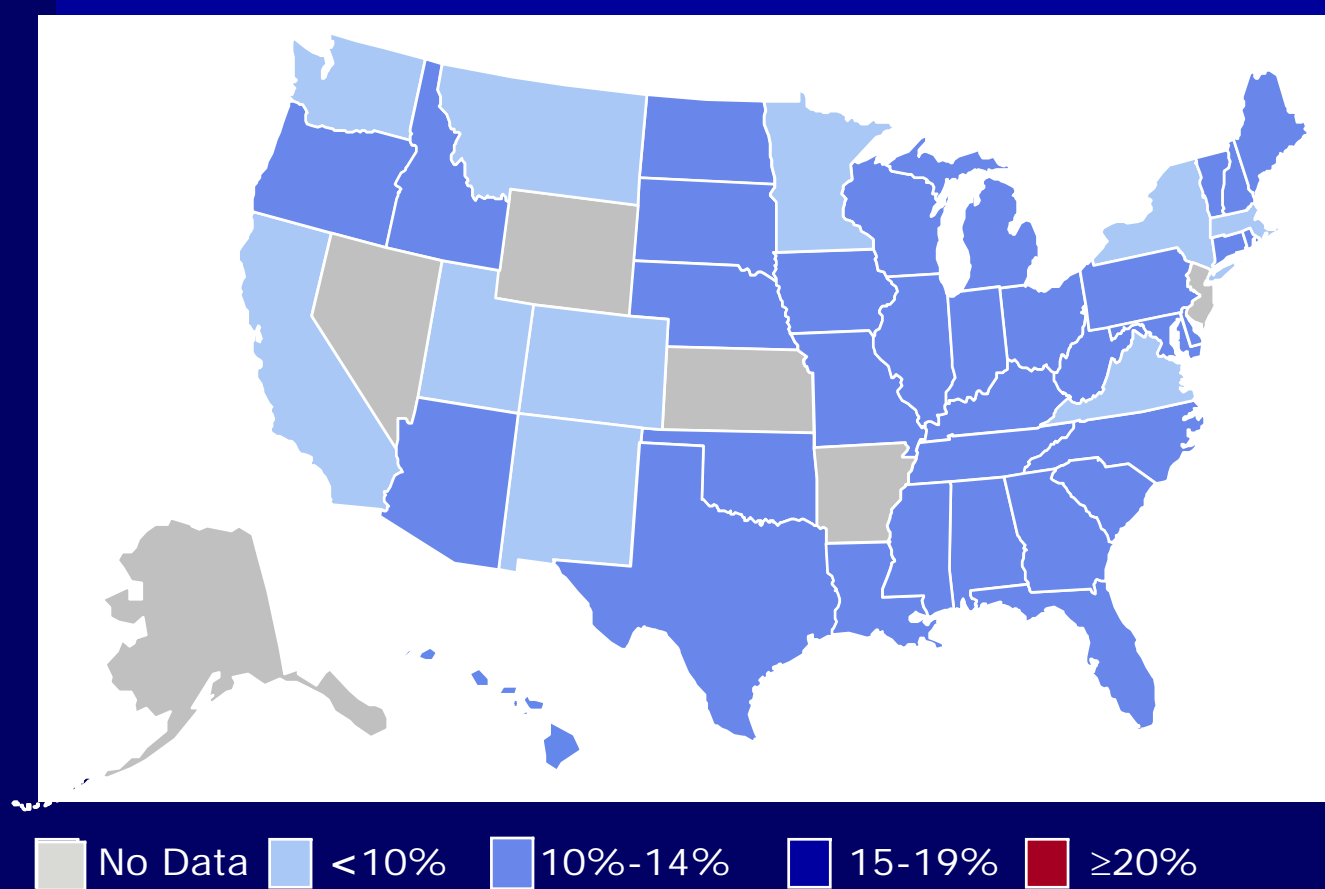
Pavement

Noise



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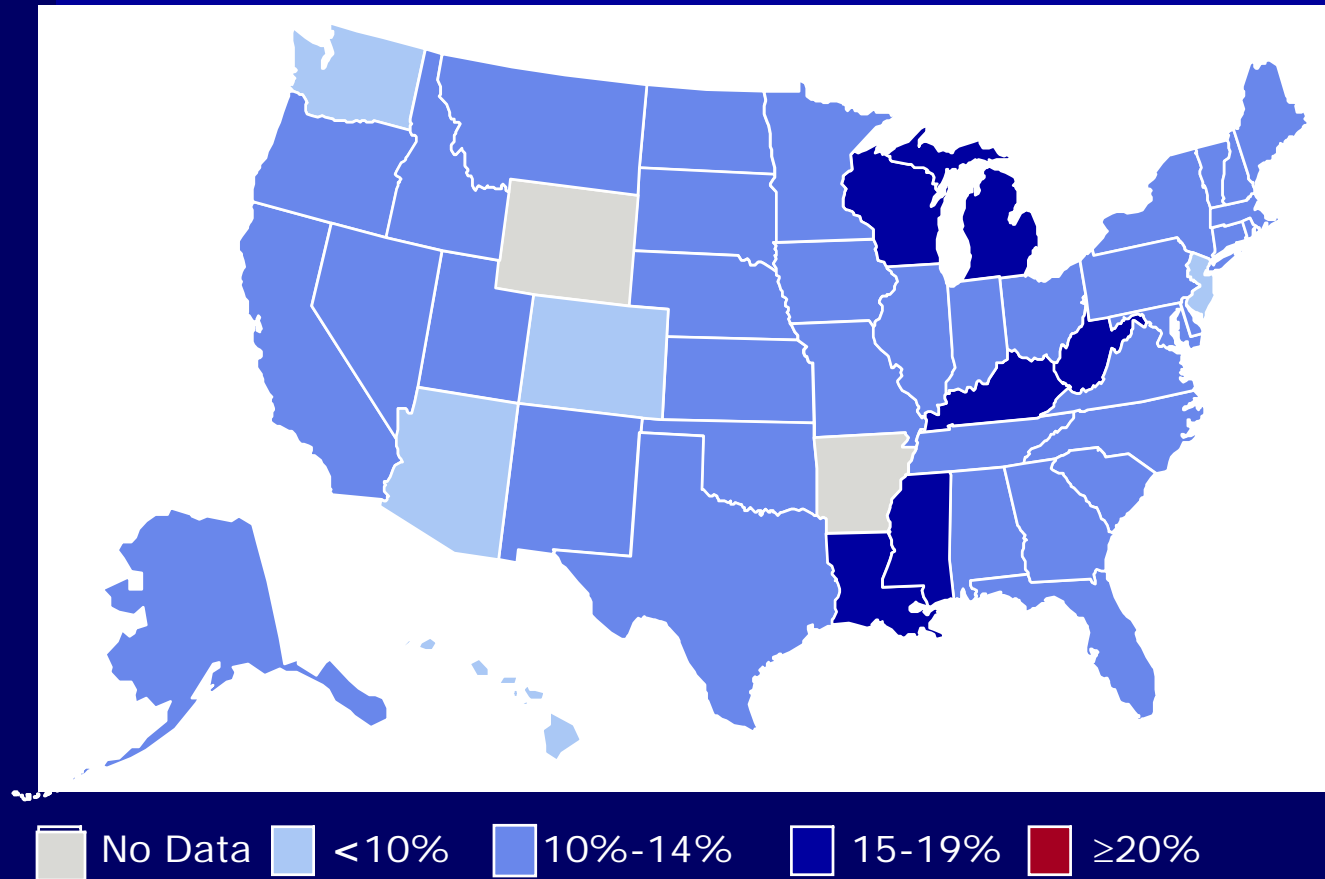
Obesity Trends Among U.S. Adults BRFSS, 1990



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Source: Mokdad A H, et al. *J Am Med Assoc* 1999;282:16, 2001;286:10.

Obesity Trends Among U.S. Adults BRFSS, 1992

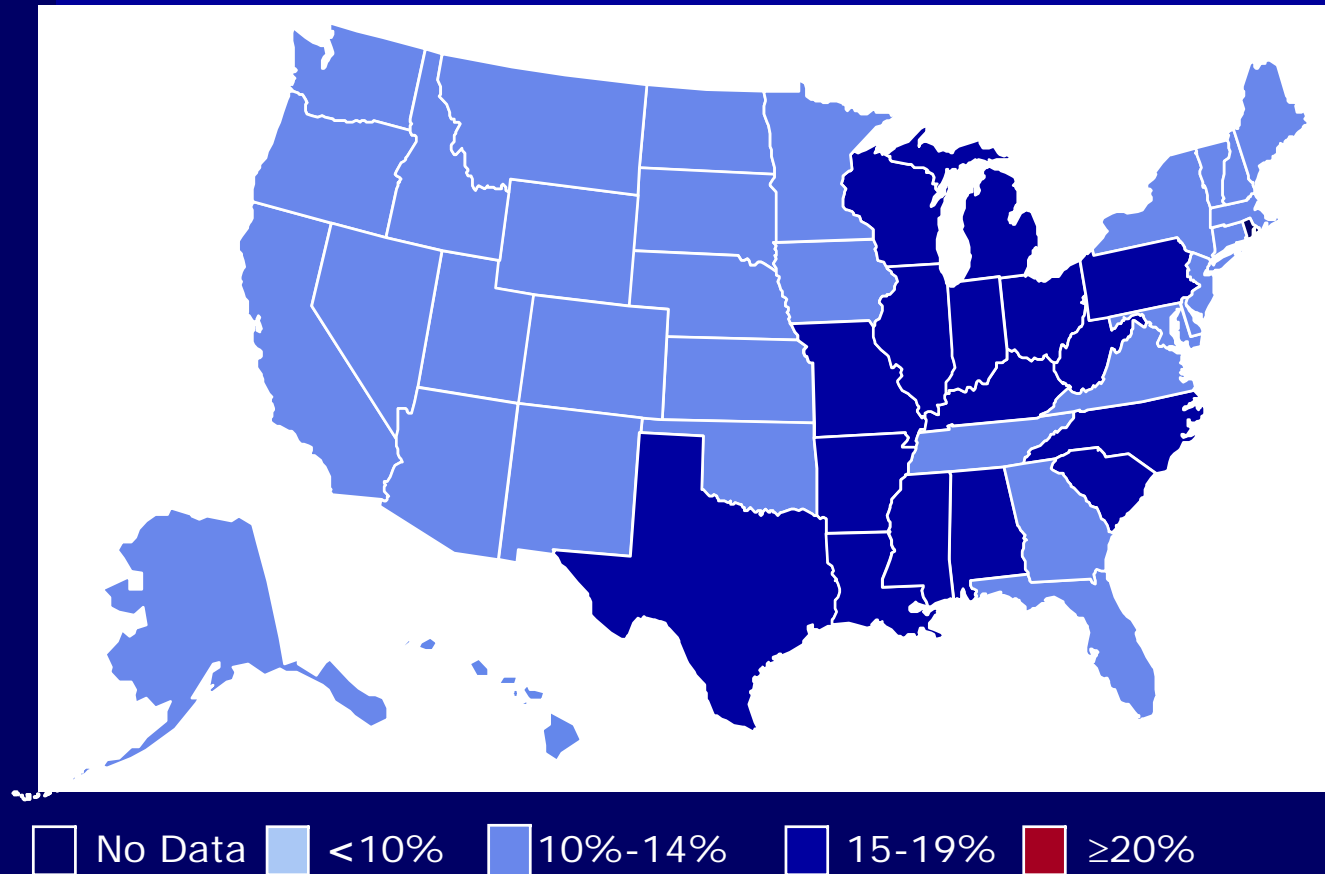


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Source: Mokdad A H, et al. *J Am Med Assoc* 1999;282:16, 2001;286:10.

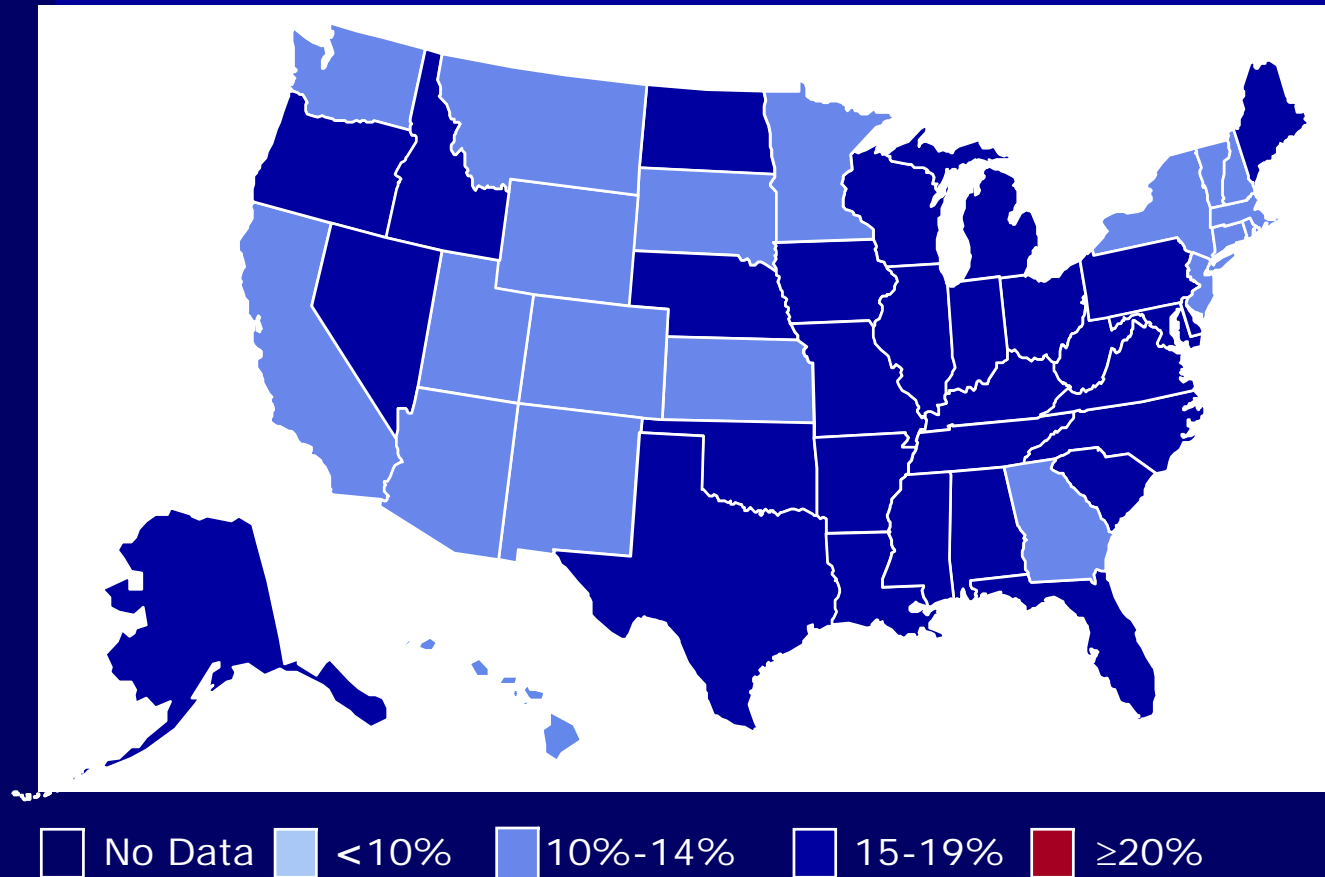
Obesity Trends Among U.S. Adults

BRFSS, 1994



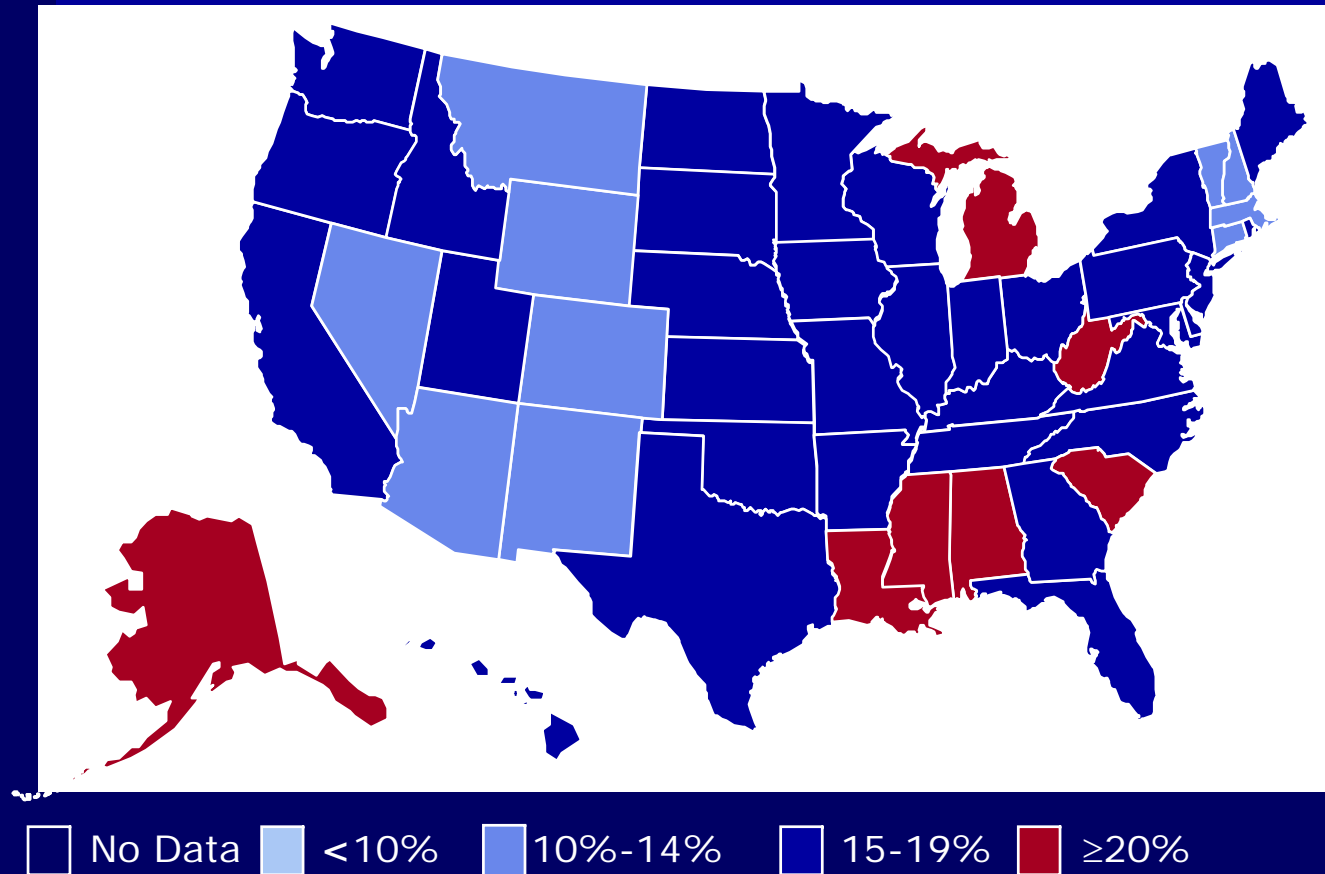
Obesity Trends Among U.S. Adults

BRFSS, 1996

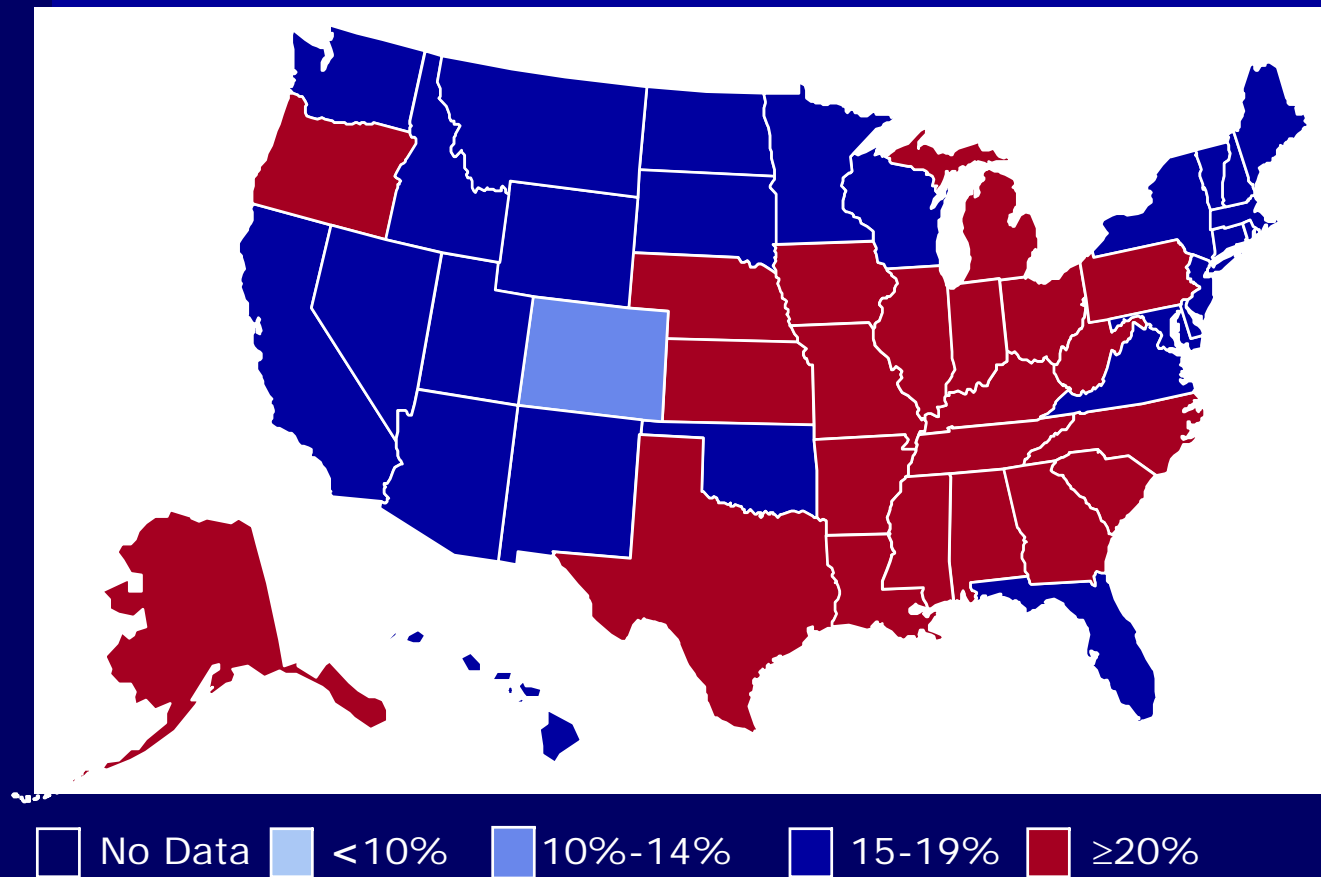


Obesity Trends Among U.S. Adults

BRFSS, 1998



Obesity Trends Among U.S. Adults BRFSS, 2000

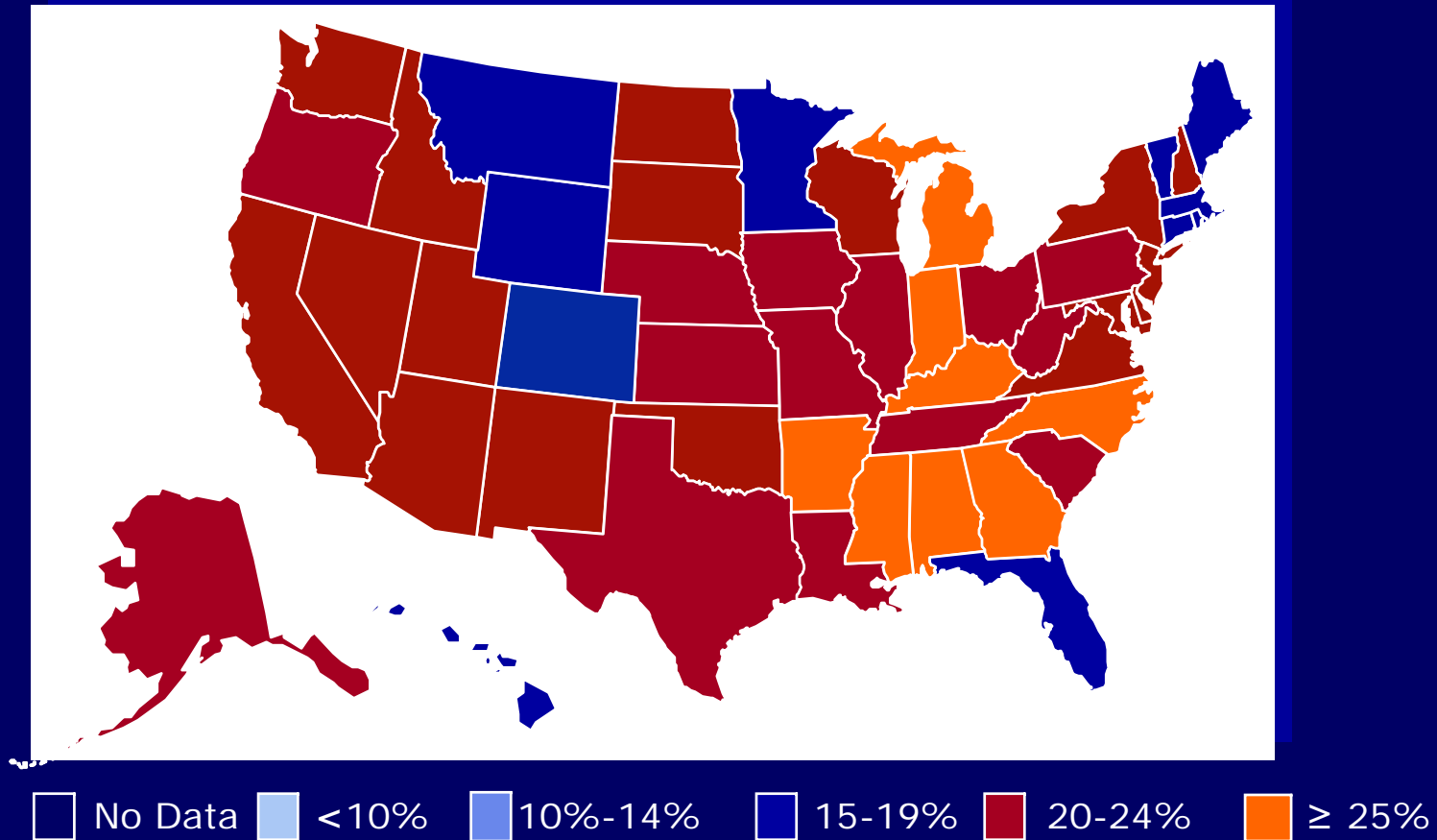


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Source: Mokdad A H, et al. *J Am Med Assoc* 1999;282:16, 2001;286:10.



Obesity Trends Among U.S. Adults BRFSS, 2003



Newsweek

September 4, 2000 : \$3.50

**TAX CUT
SMACKDOWN**

**SAINTLY
POPE**

**BEHIND
CNBC**

newsweek.msnbc.com

DIABETES

**It Strikes
16 Million
Americans**

**Are You
at Risk?**

Computer drawing of a human insulin molecule



**Washington State
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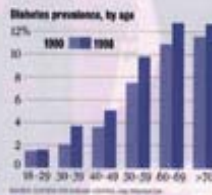
SOCIETY

An American Epidemic

Diabetes

The silent killer: Scientific research shows a 'persistent explosion' of cases—especially among those in their prime
BY JERRY ADLER AND CLAUDIA KALB

SOMETHING TERRIBLE WAS HAPPENING TO YOLANDA BENTIZ'S eyes. They were being poisoned; the fragile capillaries of the retina attacked from within and were leaking blood. The first symptoms were red lines, appearing vertically across her field of vision; the lines multiplied and merged into a haze that shut out light entirely. "Her blood vessels inside her eye were popping," says her daughter, Jannette Roman, a Chicago college student. Bentiz, who was in her late 40s when the problem began four years ago, was a cleaning woman, but she's had to stop working. After five surgeries, she has regained vision in one eye, but the other is completely useless. A few weeks ago, awakening one night in a hotel bedroom, she walked into a door, setting off a paroxysm of pain and nausea that hasn't let up yet. And what caused this catastrophe was nothing as exotic as pesticides or emerging viruses. What was poisoning Bentiz was sugar.



Heredity

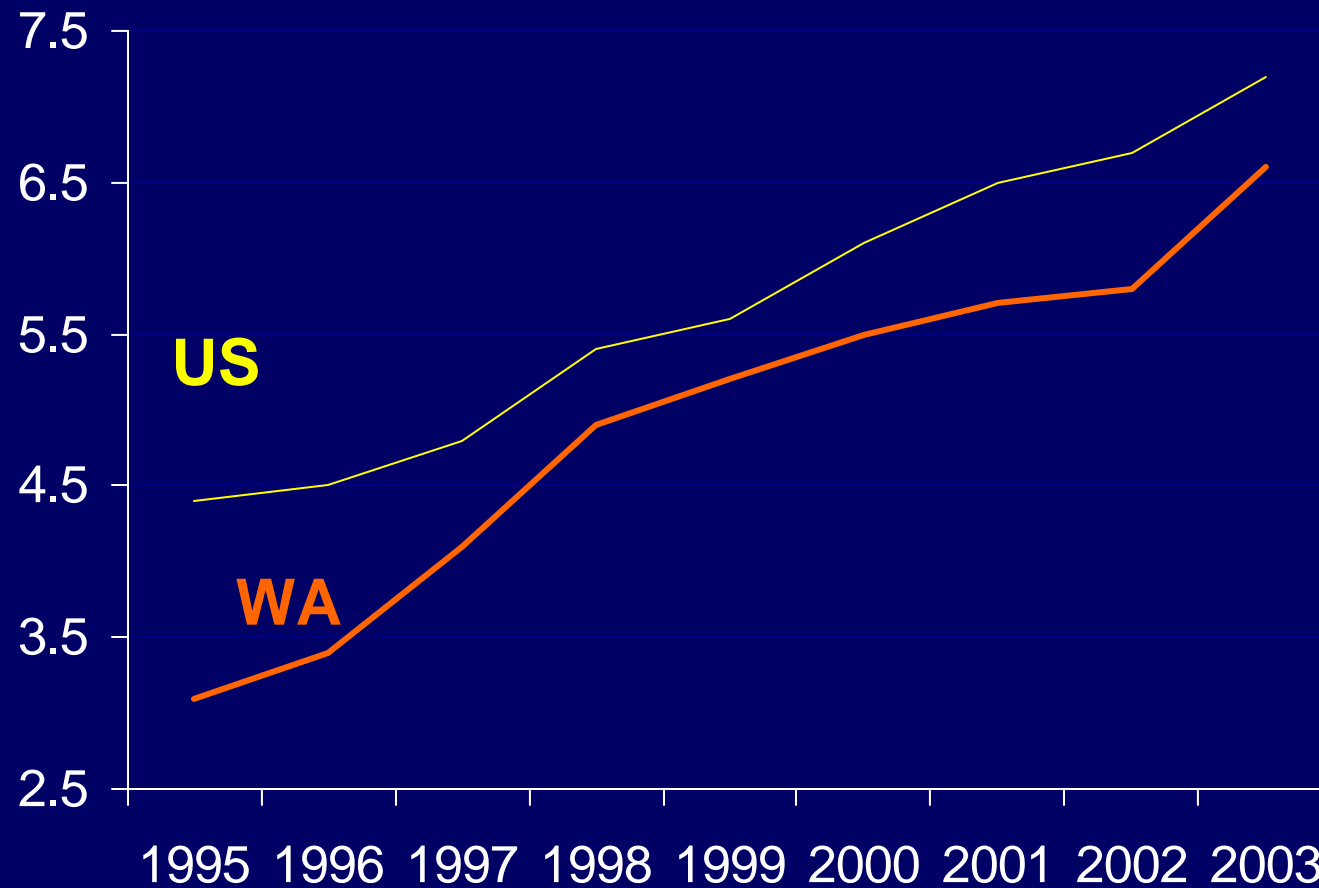
Genes help determine whether you'll get diabetes. In many families, multiple generations are struck. But heredity is not destiny—especially if you eat well and exercise.

FAMILY PLAZA: Bentiz (left) and Roman. Bentiz's mother and two brothers died from complications of the disease.



Diabetes in WA and US

% with diabetes



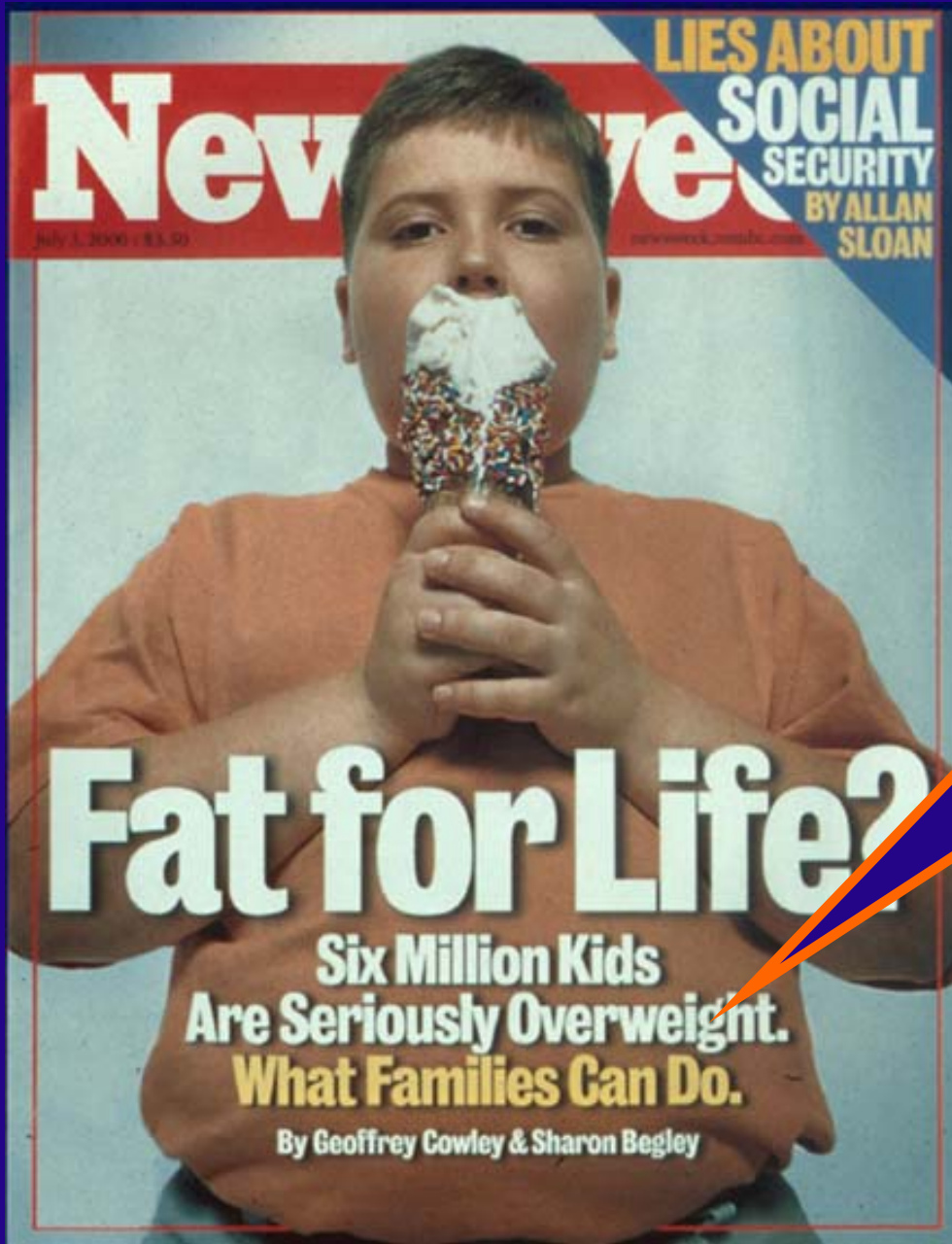
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Source: <http://www.cdc.gov/brfss/>

Other Conditions Associated with Overweight and Obesity

- Hypertension
- High cholesterol
- Heart disease
- Cancer: Colon, Uterine, Breast
- Gall bladder disease
- Liver disease
- Sleep apnea
- Osteoarthritis
- Decreased emotional well-being

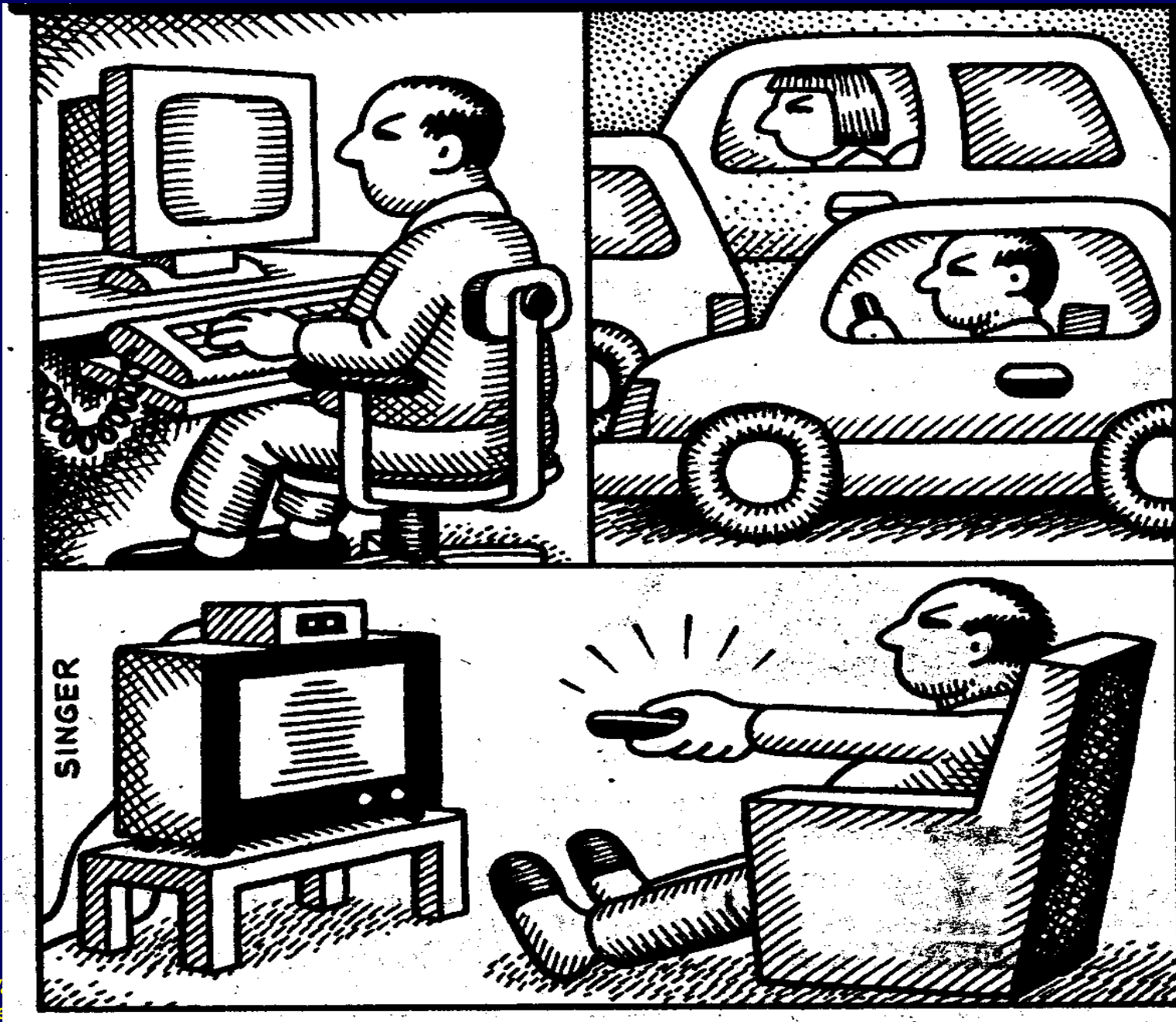




About 10% of Washington's 10th graders are seriously overweight (2002, 2004 HYS)



Department of Health

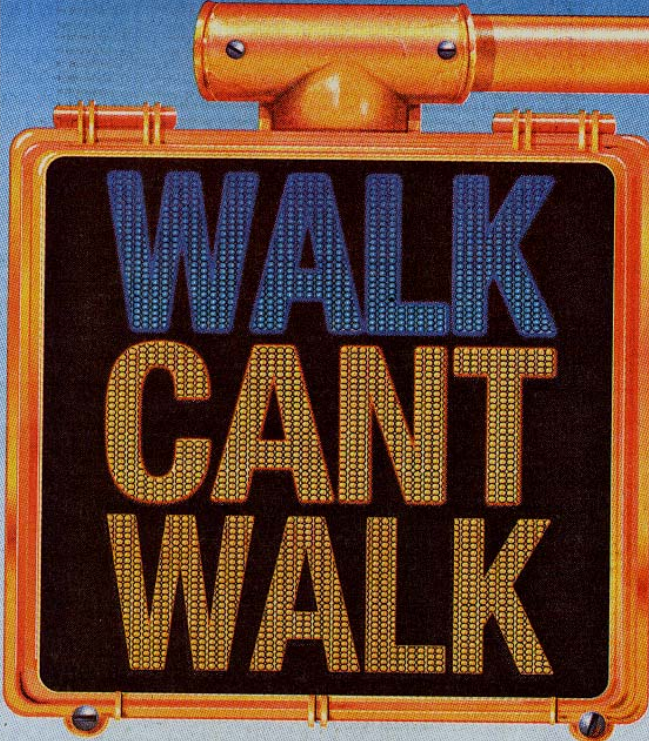




April 22, 2003



Washington State
Department of Health



By Martha T. Moore
USA TODAY

Why don't Americans walk anywhere?
Old answer: They're lazy.
New answer: They can't.
There is no sidewalk outside the front door, school is 5 miles away, and there's a six-lane highway between home and the supermarket.

Many experts on public health say the way neighborhoods are built is to blame for Americans' physical inactivity — and the resulting epidemic of obesity.

The health concern is a new slant on the issue of suburban sprawl, which metro regions have been struggling with for a decade. These health experts bring the deep-pocketed force of private foundations and public agencies into discussions about what neighborhoods should look like.

The argument over whether suburbs are bad for your health will hit many Americans precisely where they live: in a house with a big lawn on a cul-de-sac.

"The potential for actually tackling some of these things, with the savvy of the folks who have tackled tobacco, is enormous," says Ellen Vanderslice, head of America Walks, a pedestrian advocacy group based in Portland, Ore.

A study by the federal Centers for Disease Control and Prevention is tracking 8,000 residents of Atlanta to determine whether the neighborhood they live in influences their level of physical exercise. The Robert Wood Johnson Foundation in New Jersey,

Cover story

Please see COVER STORY next page ►



Washington State
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Want to take a walk?



DOT to look at risks, benefits of tree-lined sidewalks

By CHRISTOPHER QUINN
cquinn@ajc.com

Bill Godboldt would have never known what hit him.

The sound of a hubcap scraping the curb gave him a scant second of warning.

He turned his head to check out the noise as he walked along Peachtree Street to the Buckhead MARTA station, and a Lexus ground by in a blur, the driver holding a cellphone against her ear, the car so close he could have touched it.

Had the car hopped the curb, "I had nowhere to go," he said.

Or nothing to hide behind. State Department of Transportation construction standards, which cities and counties rely on when building sidewalks and streets, prohibit trees, benches or utility poles within 8 feet of the curb.

The trees are a hazard to drivers, according to DOT standards.

That's ridiculous, said Sally Flocks.



EAST SIDE

On Peachtree Road at Piedmont Road, a contrast exists between the east side of Peachtree Road and the west side. DOT standards say trees cannot be planted within 8 feet of a curb without a special dispensation.

Flocks, the blunt and energetic president of Atlanta's Pedestrians Educating Drivers on Safety, and Adam Orkin, a local developer, want the DOT to reconsider its standards.

DOT officials say they are

reviewing them, but big changes are unlikely.

To a traffic engineer's way of thinking, sidewalks are auto recovery zones, roadside areas where drivers have space to correct course if



WEST SIDE

Photos by JOHN SPINK / Staff

Deanna Kepka (from left), Carolyn Swain and Ariana Huggett walk along the tree-lined west side of Peachtree Road. A developer and pedestrian group are pressing the DOT to allow trees between sidewalks and roads.

they've veered off. Trees would ensure the driver came to an abrupt end before getting the car back on the road.

Atlanta's reputation as a dangerous place for walkers is well known,

from the death of writer Margaret Mitchell, who was run over on Peachtree Street in 1949, to the city's consistently low ranking in an

► Please see **SIDEWALK, B5**



To a traffic engineer's way of thinking, sidewalks are auto recovery zones, where drivers have space to correct course if they've veered off. Trees would ensure that driver came to an abrupt end before getting the car back on the road.



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Importance of “casual” physical activity

- In the US, 20 – 40 year olds gain about 2 pounds per year.
- For most people, the imbalance is about 100 calories per day. (Hill et al, *Science* 2003)
- Taking stairs, active transportation, walking to public transportation help



Recommendations for Moderate Physical Activity for Adults

30 minutes per day
5 days per week → everyday
10 minutes segments

Being active and physically fit has
health benefits independent of weight



DOH Obesity Prevention Grant

~ \$800,000 per year for 5 years

- TV reduction, nutrition and physical activity policy in child care and early childhood education programs
- K-12 and worksite model nutrition and physical activity policies
- Safe and Active Routes to School: funded 2004-05 school year; transitioned to DOT
- Active Community Environments – Active Living Task Forces



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Department of Health

Crashes

Obesity

Air pollution

Social determi-
nants of health

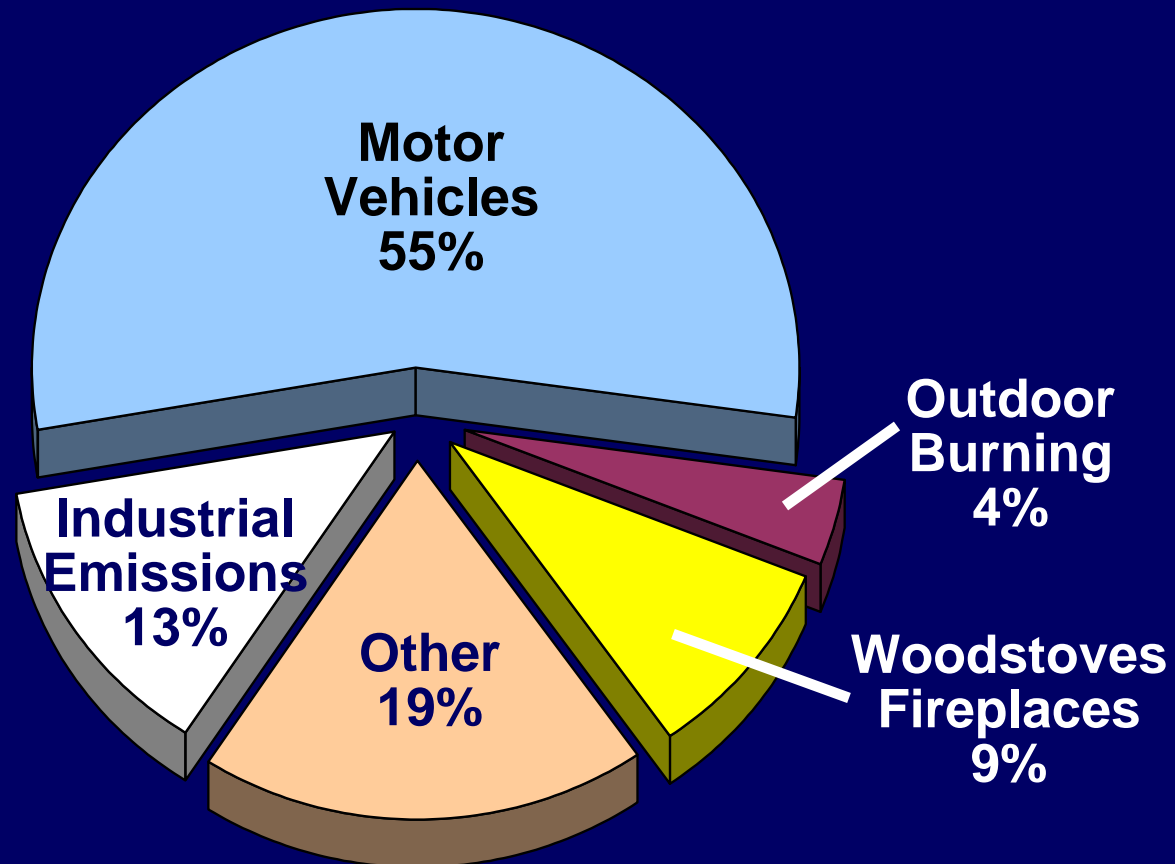
Pavement

Noise



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Department of Health

Sources of Air Pollution in Washington, 2003-2005



Washington State
Department of Health

Source: Washington State Department of Ecology

Major pollutants from motor vehicles

- Particles
- Sulfur Dioxide → Particle formation
- Nitrogen Oxides → Ozone formation
- Hydrocarbons → Ozone formation
- Greenhouse gases: CO₂



Health consequences exposure to particles

- Airway inflammation, bronchoconstriction
 - asthma, bronchitis, emphysema
- Decreased lung function in children
 - asthma, bronchitis, emphysema as adults
- Impaired respiratory defense
 - colds, flu, pneumonia
- Decreased heart rate variability
 - heart attacks
- Accumulation of particles in lungs
 - heart and lung disease including cancer



Which picture shows a **violation** of Federal Clean Air Act 24-hour health standard for fine particulates?

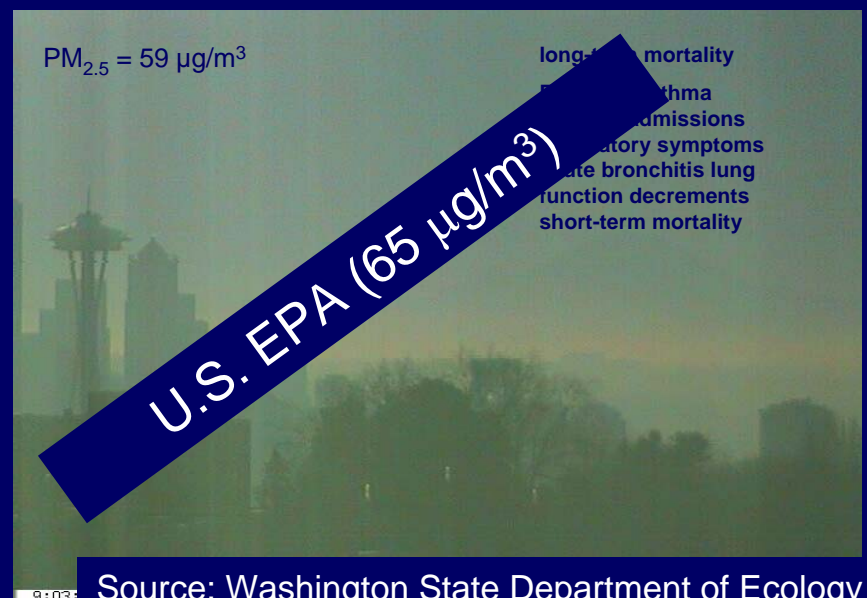


Protects health with margin of safety ($15 \mu g/m^3$)



California, British Columbia, Great Britain ($29 \mu g/m^3$)

long-term mortality
respiratory
asthma
admissions
respiratory symptoms
late bronchitis lung
function decrements
short-term mortality



U.S. EPA ($65 \mu g/m^3$)

long-term mortality
respiratory
asthma
admissions
respiratory symptoms
late bronchitis lung
function decrements
short-term mortality

Source: Washington State Department of Ecology

Fine particles from diesel are especially toxic



- Very small results in **large surface area**
- High temperature combustion produces **highly carcinogenic compounds** (e.g., nitrated PAH which body doesn't detoxify well when inhaled)
- Carcinogenic compounds adhere to the particles with large surface area and promote oxidative damage in lung



Climate and Climate Change

Warmer winter, earlier spring and decreased snow pack



**Washington State
Department of Health**

Clean Options

Solutions

A cleaner road ahead

ENVIRONMENTAL DEFENSE PARTNERSHIP WITH FEDEX IS CATALYST FOR LOW-EMISSION HYBRID VEHICLES

"The world on time." This slogan appears on FedEx Express delivery trucks that ply America's city streets and country roads. When it comes to environmental performance, the world's largest express transportation company will soon be ahead of its time.

In May, FedEx unveiled a prototype of a new hybrid electric delivery truck from Eaton Corporation that will reduce sooty particulate emissions by 90% and smog-causing emissions by 75%. The advanced vehicle also will go 50% further on a gallon of fuel.

FedEx has announced plans to buy 20 of the trucks to test in four cities starting in November. It is the first delivery company to make a long-term market commitment to use hybrid technology.

"The clear environmental and business gains signal a revolution in truck technology and set a new standard for the industry," said David J. Bronczek, president of FedEx Express. The company hopes to replace its 30,000 medium-duty

trucks with hybrids over the next 10 years.

This environmental milestone is the result of a three-year partnership between FedEx Express and Environmental Defense to create the delivery truck of the future. Environmental Defense received no money from FedEx but did receive a promise that the results of the partnership would be made public, so that other truck fleet operators could pursue the same benefits. The U.S. Postal Service, Pepsi-Frito Lay and even the

U.S. Army already have expressed interest.

THE POWER OF INNOVATION

"When Environmental Defense first approached us, I was extremely skeptical," recalled Jim Steffen, chief engineer for vehicles at FedEx Express. "But by the end of our first meeting, I was convinced of the potential benefit."

In 2001, FedEx and we jointly invited manufacturers to submit designs

Please see Cover Story, page 2



Former EPA administrator Christine Whitman joined our Fred Krupp at the unveiling.



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Department of Health

Hybrid electric: reduce

- Particles by 90%
 - Ozone-causing pollution by 75%
- Pilot testing 20 vehicles, potential to replace 30,000 over 10 years



Washington DC fleet
running on natural gas

Local, State, and Federal Programs Ecology, Regional Air Agencies, EPA

- **Anti-idling: buses and cars at schools**
- **Selected diesel strategies**
 - **Particle trap retrofit funded (\$5M/year for 5 years)**
 - **Truck stop electrification I-5 corridor**
 - **Creation of market and supply for ultra-low sulfur diesel fuel**
 - **Biodiesel pilot projects**



Health Impact Assessment: A New Planning Tool

Adapted from
Andrew L. Dannenberg, MD, MPH
National Center for Environmental Health
Centers for Disease Control and Prevention
acd7@cdc.gov

American Planning Association Conference
San Francisco, March 21, 2005



Washington State
Department of Health

What is a Health Impact Assessment?

- Procedures and tools to evaluate potential health effects of projects, policies, and programs. In U.S., currently
 - Voluntary
 - Mainly qualitative
 - Can include place-based projects and policies
- Analogous to Environmental Impact Assessments. In U.S., currently
 - Required for most place-based construction/development projects
 - Quantitative components



Why Conduct a Health Impact Assessment?

Focus attention of decision-makers on the health consequences of projects and policies to broaden scope of informed decision-making



Steps in Conducting a Health Impact Assessment

- Identify relevant projects or policies
- Identify relevant health impacts
- Determine
 - » How many people affected
 - » What people are affected (subpopulations)
 - » How they may be affected
- Report results (suitable detail for audience)
- Evaluate impact of HIA on actual decision process and outcome



Health Impacts to Consider Related to Transportation Projects

- Physical activity and obesity and related disease (e.g., heart disease, diabetes)
- Air quality, asthma, other respiratory diseases, heart disease
- Transportation-related injury and death
- Noise-related health outcomes
- Social capital, community severance
- Social equity, environmental justice



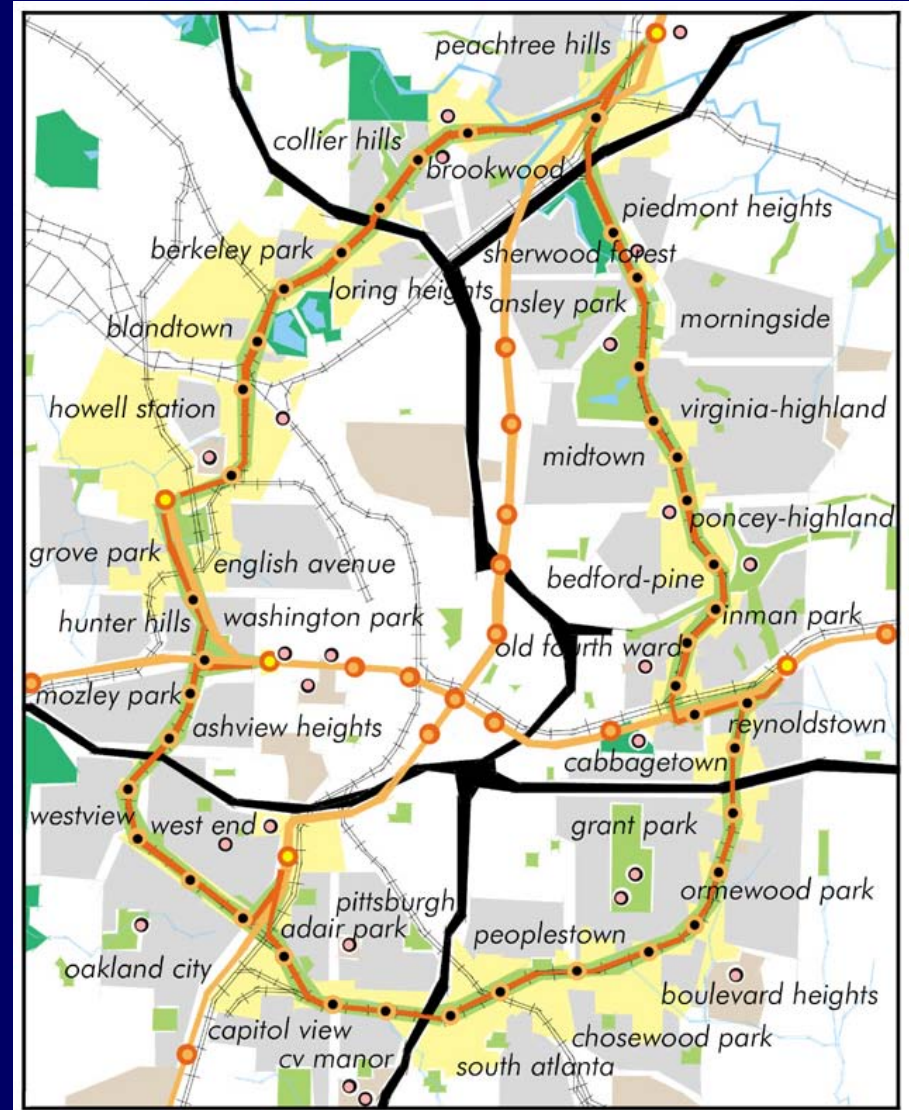
Community Involvement in Conducting an HIA

- Increases community buy-in to project
- Helps identify social issues as well as health issues
- Commonly used in HIAs in Europe
- Increases time and resources needed to conduct HIA



The Atlanta BeltLine

- Proposed 22-mile urban light rail loop
- Accompanied by a continuous multi-use trail
- Connects existing parks and 40+ neighborhoods
- Opens 2500+ acres for mixed-use redevelopment
- To be built on existing abandoned or little used rail rights of way



Public Health Benefits of BeltLine

Opportunity for Recreational Physical Activity

BeltLine trails will offer an attractive setting for walking, bicycling, and other recreational physical activity

Increased availability of trails is recommended by CDC to promote health

Existing Silver Comet, Stone Mountain, Chastain Park trails are very popular

Exercise Easily Incorporated into Daily Commute

Walking to and from BeltLine stations could readily fulfill the U.S. Surgeon General's recommendation of 30 minutes of physical activity each day

Obesity Reduction

Physical activity helps prevent obesity

Obesity and physical inactivity are associated with increased risk of overall mortality, heart disease, diabetes, hypertension, and some cancers



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Public Health Benefits (continued)

Cleaner Air

BeltLine could reduce use of automobiles whose emissions are major contributors to ground level ozone in Atlanta

Ozone is linked with increased asthma attacks and heart disease mortality

Atlanta exceeded EPA's air quality standard for ozone 51 times in 2002-2003

Fewer Traffic Injuries

Driving less reduces each individual's risk of injury on the highways

Nationally, motor vehicle crashes are the leading cause of death among persons 1 - 34 years old

Brownfield Redevelopment

Urban redevelopment of underutilized land can reduce sprawl and preserve greenspace

Redevelopment promotes health by offering economically and socially thriving communities that are walkable



Transportation and Health
Public Transportation Conference
August 24, 2005

Juliet VanEenwyk, PhD
State Epidemiologist for Non-Infectious Conditions

juliet.vaneenwyk@doh.wa.gov

- Crashes
 - » Almost 800 transportation-related deaths in Washington in 2003
 - » Almost 700 motor vehicle-related deaths
 - » Rates have been declining since 1980
- Pavement
 - » Flooding
 - » Contamination of surface water
 - » (Erosion, siltation, impaired recharge of ground water)
- Social Determinants: Handout



Obesity in Washington

- Average obese woman is 5'5" and weighs 200 pounds.
- Average obese man is 5'11" and weighs 235 pounds.



Who dies from exposures to fine particles?

- People of all ages with
 - Respiratory disease (bronchitis, emphysema, asthma)
 - Heart disease
 - Infections (flu, pneumonia)
- Elderly
- Infants

- Short-term, high-level AND long-term low-level
- Estimated deaths in Washington due to particles range from 74 deaths (1993 ALA) to 1400 (1998 NRDC).



Health and Noise from Transportation

- Noise-related stress found in communities near airports; less so in communities with heavy road traffic
 - Increased “stress” hormones
 - Increased heart disease, hypertension
 - Reduced sense of well-being & quality of life
- Learning decrements in children associated with all types of transportation noise



Noise Standards: Day-Night Limits (DNL)

- WHO: To prevent serious annoyance 50
 - EPA: To protect health and welfare
 - Fed Energy Regulatory Commission
 - World Bank: For new development
- 55
- Federal Aviation Administration 65



CDC's (and Partner's) Next Steps

- Conduct pilot tests of existing tools
- Develop a database for measuring health impacts of common projects and policies
- Develop incentives and political support for use of HIAs
- Develop staff capacity to conduct HIAs
- Conduct process and evaluate impact and outcome

